UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,823	07/29/2003	Baoxin Li	7146.0163	8148

7590 08/05/2004

Kevin L. Russell
Suite 1600
601 SW Second Ave
Portland, OR 97204-3157

EXAMINER	
SEVER, ANDREW T	

ART UNIT	PAPER NUMBER
2851	

DATE MAILED: 08/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/630,823	LI ET AL.	
	Examiner	Art Unit	
	Andrew T Sever	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-85* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-85* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 11/3/2003 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

Japanese reference 2-130526 has no translation and no statement of relevancy, accordingly it was not considered. All other documents and patents were considered.

Drawings

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:
(1) if a machine or apparatus, its organization and operation;
(2) if an article, its method of making;
(3) if a chemical compound, its identity and use;
(4) if a mixture, its ingredients;
(5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

4. The abstract of the disclosure is objected to because it does not sufficiently describe what is new or the improvement that has been made to the art to in which the invention pertains. Correction is required. See MPEP § 608.01(b).

(The abstract consists of one short sentence simply stating what a projection system is defined as and does not even mention keystoning or off-axis projecting.)

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

6. The disclosure is objected to because of the following informalities: On page 5 the term "C" is used without telling what it is.

Appropriate correction is required.

Although the applicant is permitted to use equations and variables in the disclosure, applicant is required to explain what they represent. It is believed that applicant is incorporating by reference the definition of "C" from the Sukthankar et al. reference, however applicant does not make that clear. Appropriate correction is required.

Claim Objections

7. Claim 56 is objected to because of the following informalities: grammar. Appropriate correction is required.

Claim 56 is missing commas and even with them is difficult to understand. For purposes of a prior art rejection claim 56 will be read as: "wherein said imaging devices is free from, including the projector optics from which said image is projected, of said projector", however applicant is encouraged to find better wording as this is still confusing and grammatically poor.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 66 recites the limitation "user depressing a single button" in claim 65. There is insufficient antecedent basis for this limitation in the claim.

Claim 65 claims that steps b-f are performed free from user interaction with the projector, however claim 66 claims that the user interacts with the projector. Accordingly claim 66 is in conflict with claim 65 which it is dependent on. Accordingly claim 65 will not have a prior art rejection applied, since steps b-f cannot be performed both free from user interaction and with user interaction at the same time.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-14, 17-19, 21-25, 30-32, 34, 35, 40-42, 55-65, 67-72, and 78-85 are rejected under 35 U.S.C. 102(e) as being anticipated by Sukthankar et al. (US 6,753,907.)

Sukthankar teaches in figure 2

A method for adjusting keystoning in a projector, comprising:

(a) sensing using an imaging device at least two boundaries defining a projection screen (Sukthankar teaches that projection screens are typically a quadrilateral in column 2 lines 1-20 and teaches in column 4 lines 40-52 that when determining boundaries electronically of a quadrilateral the 4 corners are used *as is claimed in applicant's claims 2-5*);

(b) determining a transformation to adjust the keystoning of an image projected from said projector (32);

(c) modifying said image projected from said projector in accordance with said transformation (34);

(d) projecting said modified image from said projector, wherein said imaging device and said projector are maintained in a fixed relationship with respect to each other (although not explicitly stated in the flow chart of figure 2, the image is then projected at 22.)

With regards to applicant's claims 6-8:

Sukthankar teaches in columns 4 and 5 starting with lines 63 to 47 the exact means by which the image is transformed which includes both horizontal and vertical adjustment which is further demonstrated in figure 5 for example which

shows that the un-adjusted image is distorted both horizontally and vertically and the final un-distorted image 20 is completely corrected which would require adjustment in two different directions (as is claimed in applicant's claim 8)

With regards to applicant's claim 9:

Sukthankar teaches in column 6 lines 13-21 an alternative embodiment where the camera is integral to the projector.

With regards to applicant's claim 10:

Sukthankar teaches in column 4 lines 8-24 that the above method can be performed fully automatically and further teaches in column 5 lines 55-60 that in an alternative embodiment automatic focusing is performed before keystone correction.

With regards to applicant's claim 11:

As shown in figure 2, the method is performed in the order claimed in applicant's claim 10.

With regards to applicant's claim 12:

The manual initiating of the keystone adjustment process is inherently initiated by pressing a button.

With regards to applicant's claims 13 and 14:

The camera is held either integral with the projector as in claim 9 or in a fixed relationship elsewhere (including offset as is claimed in applicant's claim 14) as taught in columns 3 and 4 starting at line 50 through line 24.

With regards to applicant's claim 17:

As described in column 5 lines 56-60, everything is based on the previous step in the method.

With regards to applicant's claim 18:

See above.

With regards to applicant's claim 19:

As described in column 4 lines 8-24 the method can be fully automatic, partially automatic or fully manual, other then the fully automatic, the user would initiate the adjustment process.

With regards to applicant's claims 21 and 22:

See above in the case of fully automatic.

With regards to applicant's claim 23:

See with regards to applicant's claim 19 where the method is not fully automatic.

With regards to applicant's claim 24:

Sukthankar teaches in column 4 lines 13-24 that in semi-automatic calibration that the keystone adjustment is directed by a user.

With regards to applicant's claim 25:

A pattern is projected (calibration regions).

With regards to applicant's claims 30 and 31:

In the semi-automatic mode, the user indicates a direction of adjustment of keystone adjustment, which inherently can be one of a plurality of directions (see column 4 lines 8-24)

With regards to applicant's claims 32 and 42:

The image inherently dynamically changes.

With regards to applicant's claim 34:

In fully manual the user specifies the ratio of with to length.

With regards to applicant's claim 35:

See the with regards to applicant's claim 25

With regards to applicant's claims 40 and 41:

See the with regards to applicant's claims 30 and 31 above.

With regards to applicant's claim 55:

See above.

With regards to applicant's claims 56-58:

See the with regards to claims 13 and 14.

With regards to applicant's claims 59-62:

These are aspects of manual adjusting of either focusing or keystoning, Sukthankar teaches both software correction and hardware correction (column 5 lines 48 through column 6 lines 12.)

With regards to applicant's claims 63 and 64:

The calibration parameters are inherently stored in parameters, which are inherently in look up tables.

With regards to applicant's claim 65:

See above.

With regards to applicant's claim 67:

See the with regards to applicant's claim 10.

With regards to applicant's claim 68:

Clearly the auto-positioning centers the image on the projection screen.

With regards to applicant's claims 69-71:

The location/shape of the screen is determined before the transformation and other optical changes are made.

With regards to applicant's claim 72:

See the with regards to applicant's claims 13 and 14.

With regards to applicant's claim 78:

See above.

With regards to applicant's claim 79:

As shown in figure 1 among others the screen is rectangular.

With regards to applicant's claim 80:

The image is also rectangular.

With regards to applicant's claims 81 and 82:

The lower edge of the projection screen is horizontally aligned with respect to a user. (Inherent.)

With regards to applicant's claim 83:

The image modifying is performed after the image adjusting for keystone effect.

With regards to applicant's claims 84 and 85:

See above.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 15, 16, 20, 27-29, 33, 37-39, 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sukthankar as applied to claims 1-14, 17-19, 21-25, 30-32, 34, 35, 40-42, 55-65, 67-72, and 78-85 above and further in view of Hasegawa (US 6,598,978.)

Sukthankar as described above teaches a method for adjusting keystoning in a projector which comprises initiating a keystoning adjustment process, sensing using an imaging device an image projected by the projector, adjusting the focus of the projector, determining a transformation to adjust the keystoning of an image projected from the

projector; modifying the image projected from the projector in accordance with the transformation; and projecting the modified image from the projector. Sukthankar does not teach a further imaging device sensing the image.

Having a further sensing device to allow a user to interact with either the projector or with the computer performing the presentation is taught by Hasegawa. Hasegawa teaches in figure 1 a projection system including a projector (2), a camera (1), and a pointer (4, which can also be considered a remote control as is claimed in applicant's claim 20). Hasegawa teaches in column 1 lines 13-22 that such a system allows the user to draw on the display image among other things. Given that it is useful to allow a user to interact with the presentation system, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include additional imagining devices for sensing the images on the screen.

With regards to applicant's claims 27-29, 33, 37-39, and 43:

Although Hasegawa does not teach using the pointer specifically to control the Keystone, one with ordinary skill in the art would recognize that remote controls including in the form of a pointer are frequently used to adjust such things as focus, and keystone. Accordingly the pointer/remote control of Hasegawa can be used to control the projector.

14. Claim 26, 36, and 44-54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sukthankar as applied to claims 1-14, 17-19, 21-25, 30-32, 34, 35, 40-42, 55-65, 67-72, and 78-85 above and further in view of Geng (US 6,700,669.)

Sukthankar as described above teaches a method for adjusting keystoning in a projector which comprises initiating a keystoning adjustment process, sensing using an imaging device an image projected by the projector, adjusting the focus of the projector, determining a transformation to adjust the keystoning of an image projected from the projector; modifying the image projected from the projector in accordance with the transformation; and projecting the modified image from the projector. Sukthankar does not specifically teach projecting patterns which comprise different frequencies and Sukthankar does not teach specifically teach a method for locating the screen.

Geng teaches a method for locating various objects, which would include screens that are at any orientation to a projector, and determining their shape and orientation. Geng teaches in column 4 lines 59-65 that multiple frequencies are projected (patterns) on the surface to be projected upon. This image is then captured by a plurality of image capturing devices (see figure 11). With the captured image a processor performs a series of steps that are described in columns 6 and 7, which includes applicant's steps a-f of claim 44.

Geng teaches in column 4 lines 43-55 that this method is far superior to prior art method of locating a screen or other surface to be projected upon in terms of accuracy and speed. Given that in the keystone correcting projection arts it is highly useful for the projector to know exactly what orientation the screen is to the projector and in the case

where the screen is planner the shape of the screen (see for example US 6,431,711 to Pinhanez which teaches projecting on non-planner surfaces), it would have been obvious to one of ordinary skill in the art at the time the invention was made to include Geng's method of determining the location of a screen by a projector in the projector taught by Sukthankar.

With regards to applicant's claims 26 and 36:

Geng teaches multiple frequencies. (See above.)

With regards to applicant's claim 46:

Geng determines the location of the screen relative to the projector.

With regards to applicant's claims 47 and 48:

Geng teaches that the image is received by an image sensor device in column 4 lines 14 such as a CCD camera, which is made up of a plurality of one-dimensional sensors.

With regards to applicant's claim 49:

Geng teaches using a plurality of imaging devices.

With regards to applicant's claims 50-54:

See the rejection of claims 1-14, 17-19, 21-25, 30-32, 34, 35, 40-42, 55-65, 67-72, and 78-85 above.

15. Claims 73-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sukthankar as applied to claims 1-14, 17-19, 21-25, 30-32, 34, 35, 40-42, 55-65, 67-72, and 78-85 above and further in view of Chen et al. (US 6,367,933.)

Sukthankar as described above teaches a method for adjusting keystoning in a projector which comprises initiating a keystoning adjustment process, sensing using an imaging device an image projected by the projector, adjusting the focus of the projector, determining a transformation to adjust the keystoning of an image projected from the projector; modifying the image projected from the projector in accordance with the transformation; and projecting the modified image from the projector. Sukthankar does not specifically teach estimating a depth of the projection screen.

Calculating the depth of the screen is part of automatically adjusting the focus when also adjusting keystoning for off-axis projecting as taught by Sukthankar. Such a teaching is provided by Chen in figure 9a as well as columns 17 and 18. Chen teaches in column 2 lines 48-65 that by calculating such things as depth and other characteristics to such a degree, the original image can be projected without distortion, accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to include estimating the depth of the projection screen in the method of Sukthankar.

With regards to applicant's claims 74-77:

See above with regards to applicant's claims: 1-14, 17-19, 21-25, 30-32, 34, 35, 40-42, 55-65, 67-72, and 78-85.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 6,704,000 to Carpenter, teaches in figure 1 a remote control which is also a pointer and in figure 3 a method which includes selecting four corner for producing a transformation.

US 2004/0041985 to Kimura et al. teaches a projector executing keystone correction which includes both manual and automatic modes (See figure 1), teaches on page 1 that keystone correction can be triggered by pushing the light on button.

US 2002/0021418 to Raskar teaches an off axis keystone correcting projector see figures 3 and 4 for example.

US 2003/0043303 to Karuta et al. teaches in figures 12 and 13 a method for correcting keystoning.

US 6,520,647 to Raskar teaches in figures 4 a projector which corrects for keystone distortion.

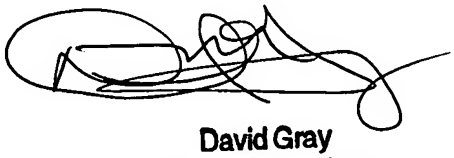
US 6,431,711 to Pinhanez teaches in the abstract a projector which can project onto any surface both planar and non-planar and compensates for the resulting keystone and other distortions.

US 2004/0061838 to Mochizuki et al. teaches in figure 1 a projector having an image-capturing device inside the projector. The projector as shown in figure 8 corrects for keystoning.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



AS

David Gray
Primary Examiner